

Remarks

The undersigned apologizes for presenting claims in a form which caused the Examiner to state that "It is not understood whether the applicant is claiming a process or apparatus."¹ As presently amended Claims 1-3 and 21-27 are all directed to an apparatus called a "jacket". The remaining pending claims, namely Claims 4-14, and 16-20 are all directed to the process for producing the jacket of Claim 1. In fact the broadest process claim, Claim 4, states that it is a "process for producing the jacket of Claim 1". It is proper for this process claim to be dependent on an apparatus claim since it is a process for producing that apparatus. It is also proper for this process claim to remain in the same case with the apparatus claims. No restriction requirement should issue. Should the Examiner issue a restriction requirement, the applicant reserves all rights including the right to traverse.

Process Claim 4 has been rewritten in classic process form clearly enumerating the steps in the claimed process. All other process claims are either directly or indirectly dependent on Claim 4.

It is respectfully submitted that by the present amendments, the objections to all the then-pending claims under the second paragraph of 35 USC 112 have been overcome. It is also hoped that these amendments will facilitate examination.

Support for newly added Claim 21 is to be found in the specification and claims as filed and in particular in Claim 2.

Support for newly added Claims 22 and 23 is to be found in the specification and claims as filed and in particular in Claim 3.

Support for newly added Claim 24 is to be found in the specification and claims as filed and in particular in Claim 2.

¹Office action mailed 12/15/93, Page 2, Line 4.

Support for newly added Claim 25 with respect to the moisture sorbing material of Subparagraph A is to be found in the specification and claims as filed and in particular in Claim 2 and as to the preferred getter material of Subparagraph B is to be found in Claim 16.

Support for newly added Claim 26 is to be found in the same places as Claim 25 as to Subparagraphs A and B and as to the hydrogen converter of Subparagraph C, there is support in as filed Claim 3.

Support for newly added Claim 27 is to be found in the locations as described above as to Claims 25 and 26. Support for this preferred embodiment is also to be found in Example 3 beginning on Page 13 at Line 30 of the specification.

The "barium oxide" of Claim 27 Paragraph A is supported by its formula "BaO" given in the Specification on Page 14 at Line 18.

The "getter material" of Claim 27 Paragraph B is supported in the Specification on Page 14 at Line 12 which gives the same formula namely "BaLi₄".

The "palladium oxide" of Claim 27 Paragraph A is supported by its formula "PdO" given in the Specification on Page 14 at Line 19.

The invention is not obvious

The rejection of all claims as obvious over Hnilicka U. S. Patent 3,130,561 ("Hnilicka") in view of USSR 1,157,711 ("SU") is traversed.

All pending claims require the presence within the inner space of at least two materials². One material is a "moisture sorbing material", the other material is a "getter material". Hnilicka discloses only the use of zeolites and these are not in the inner space. The inner space of Hnilicka is the

²Some claims require the presence of three materials as explained below.

"space 14 to be evacuated"³. The absorbent 20 of Hnilicka is not located in this space but is located downstream of the diffusion pump 16. there is no disclosure in Hnilicka of the use of his zeolites in his inner space 14.

There is no disclosure in Hnilicka of the addition to his inner space 14 of a getter material. This deficiency of Hnilicka is not supplied by SU.

Regarding the inner space of SU, called a "cavity" it is stated that the "cavity (3) [is] filled with a sorbent gas"⁴. Placing a gas sorbent 4 in a sorbent gas teaches nothing about modification of the disclosure of Hnilicka. This is true even though SU appears to disclose porous titanium as an alternative for his zeolites⁵.

Newly added independent Claims 25, 26, and 27 all require the presence in the inner space of one or more of specific chemical compounds, none of which are disclosed in either Hnilicka or SU.

Newly added Claims 26 and 27 require the presence of THREE different classes of materials: first the moisture sorbing material of Subparagraph A; second the getter material of Subparagraph B; and third the hydrogen converter of Paragraph C. No reference teaches or suggests the presence in the inner space of any material from each of these three classes as required by Claim 26 nor the specific chemicals as recited in Claim 27.

In summary it is respectfully submitted that it would not be obvious to combine the references. Even assuming arguendo the obviousness of their combination the result would still not be the claimed subject matter.

³Hnilicka, Column 3, Line 63.

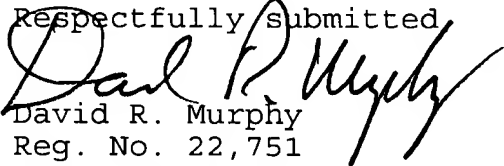
⁴SU abstract, Line 2.

⁵SU second full page, Right Column, Line 11 appears to state "...zeolite or porous titanium".

As the Examiner has correctly recognized, the other references cited but not applied, fail to disclose or suggest the claimed subject matter.

In summary it is respectfully submitted that all grounds of rejection have been overcome by argument or amendment, and that the Examiner would be justified in passing the case to issue. Such action is earnestly solicited.

Respectfully submitted,


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Appendix A "REVISED CLAIMS" (5 pages)
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REVISED CLAIMS

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1. (amended) An improved [process for evacuating and making ready a] thermally insulating jacket [and in particular the thermally insulating jacket (5) of a dewar or of another cryogenic device (1)], having an inner wall [(2)] and an outer wall [(4)], and having an [the] inner space between said walls completely or partially filled with an insulating material [(9)], wherein said inner space also contains a moisture sorbing material [(10)] and a getter material [(11)], wherein [characterized in that] said moisture sorbing material [(10)] is a [chemical drying agent] moisture sorbing material, having a H₂O vapor pressure lower than 1 Pa at room temperature.

2. (amended) A [process] jacket according to Claim 1, characterized in that said [chemical drying agent] moisture sorbing material has [is provided with] a H₂O vapour pressure lower than 1 Pa at room temperature [and is preferably selected from barium oxide, strontium oxide, phosphorous oxide and mixtures thereof].

3. (amended) A [process] jacket according to Claim 1 wherein, in the case no liquid hydrogen is present inside or outside said jacket, said inner space also contains a hydrogen converter [preferably selected from the oxides of osmium, iridium, ruthenium, rhodium and (most preferably) palladium, optionally admixed with BaO].

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4. A process [according to] for producing the jacket of Claim 1, characterized by the following steps:

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A. evacuating the inner space of the jacket [is first evacuated] down to a pressure lower than 100 Pa by means of a vacuum pump having a connection between the pump and the inner space of the jacket;

B. exposing said inner space [is] contemporaneously [exposed] to said moisture sorbing material [chemical drying agent (10) and optionally to aid hydrogen converter (providing no liquid hydrogen be present inside or outside the jacket,) while keeping the getter [(11)] in an inactivated form;

C. evacuating said inner space [is evacuated] farther, down to a pressure lower than 5 Pa, by means of the [a] vacuum pump;

D. activating said getter [(11) is activated]; and

E. isolating the jacket [is isolated] from the vacuum pump, by sealing the connection between said vacuum pump and the inner space of the jacket.

5. A process according to Claim 4 characterized in that during the exposing [exposure] of step B, the evacuating [pumping] according to Step A is discontinued.

6. A process according to Claim 4, characterized in that during the Steps A and B, the inner wall [(2) of said dewar, or of another cryogenic device] is kept hot at a temperature of not higher than 150°C [and preferably 120°C,] thus promoting the release of water from the insulation material [(9)].

7. A process according to Claim 4, characterized in that the step B lasts for up to 48 hours.

8. A process according to claim 4 characterized in that said [chemical drying agent] moisture absorbing material [(10)] and said getter [(11)] are lying, in separate locations, against the outer wall [(4)] of said jacket [dewar or other cryogenic device].

9. (amended) A process according to Claim 8 characterized in that said [chemical drying agent] moisture sorbing material [(10)] and said getter [(11)] are arranged in a container [(12)] subdivided into an inner zone [(14)] and an outer [(15)] zone by a porous septum [(13)], wherein:

- the inner zone [(14)] contains said getter [(11)];
- the outer zone [(15)] is communicating with the inner zone [space] containing said insulating material [(9)] and contains said [chemical drying agent] moisture sorbing material [(10)] which prevents the passage of water vapour through said septum [(13)] and towards said getter [(11)].

10. (amended) A process according to Claim 9 characterized in that said container [(12)] is a vertical box having an opening at its uppermost portion and a planar septum [(13)].

11. (amended) A process according to Claim 9 characterized in that said container [(12)] is a toroidal box having a radial or planar septum [(13)].

12. (twice amended) A process according to Claim 10, characterized in that said septum [(13)] is horizontal.

12 13. (amended) A process according to Claim 9, characterized in that said container [(12)] is a rigid, semirigid or flexible box.

Sub E5 14. (amended) A process according to Claim 9, characterized in that said container [(12)] is made from a substantially water-free material, selected from the group consisting of metal, glass, ceramics and combinations thereof.

16. (twice amended) A process according to Claim 4 [1], characterized in that said getter material [(11)] is an alloy having the [raw] formula $BaLi_4$.

17. A process according to Claim 4 wherein step B lasts from about 2 to about 48 hours.

18. A process according to Claim 5 wherein step B lasts from about 2 to about 48 hours.

19. A process according to Claim 6 wherein step B lasts from about 2 to about 48 hours.

20. (amended) A process according to Claim 4 [11], characterized in that said septum [(13)] is horizontal.

21. A jacket of Claim 1 wherein said moisture sorbing material is selected from the group consisting of barium oxide, strontium oxide, phosphorous oxide, and mixtures thereof.

22. A jacket of Claim 1 wherein the inner space between the walls contains a hydrogen converter.

23. A jacket of Claim 22 wherein the hydrogen converter is selected from the group consisting of osmium oxide, iridium oxide, ruthenium oxide, rhodium oxide and palladium oxide.

24. A jacket of Claim 22 wherein the hydrogen converter is palladium oxide; the moisture sorbing material is barium oxide; and the getter material is a non-evaporable alloy consisting essentially of barium and lithium.

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25. An improved thermally insulating jacket, having an inner wall and an outer wall, and having an inner space between said walls completely or partially filled with an insulating material, wherein said inner space also contains:

A. a moisture sorbing material selected from the group consisting of barium oxide, strontium oxide, phosphorous oxide, and mixtures thereof; and

B. a getter material which is an alloy of the formula $BaLi_4$.

26. An improved thermally insulating jacket, having an inner wall and an outer wall, and having an inner space between said walls completely or partially filled with an insulating material, wherein said inner space also contains:

A. a moisture sorbing material selected from the group consisting of barium oxide, strontium oxide, phosphorous oxide, and mixtures thereof; and

B. a getter material which is an alloy of the formula $BaLi_4$; and

C. a hydrogen converter selected from the group consisting of osmium oxide, iridium oxide, ruthenium oxide, rhodium oxide and palladium oxide.

27. An improved thermally insulating jacket, having an inner wall and an outer wall, and having an inner space between said walls completely or partially filled with an insulating material, wherein said inner space also contains:

A. a moisture sorbing material which is barium oxide; and

B. a getter material which is an alloy of the formula $BaLi_4$; and

C. a hydrogen converter which is palladium oxide.